

REMARKS

The Office Action of February 6, 2007 has been received and carefully reviewed. It is submitted that, by this Response, all bases of rejection are traversed and overcome. Upon entry of this Amendment, claims 1-20, 48, 49 and 68-71 remain in the application. Claims 65-67 are cancelled herein. Reconsideration of the claims is respectfully requested.

Claims 1-10, 15-17, 20, 48, 49, 68, 69 and 71 stand rejected under 35 USC 102(b) as being anticipated by Li et al. (U.S. Patent Publication No. 2002/0142202). Claims 18 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li. The Examiner states that Li discloses a fuel cell having a substrate (e.g., an electrolyte or current collector), and a patterned film composed of a metal anode material including nanofibers dispersed therein. The Examiner concludes that the electrode nanofibers enhance catalytic activity and conductivity, and increase the number of sites at which catalysis takes place. The Examiner states that Li also discloses that the cathode electrode contains catalyst materials. The Examiner then concludes that it would be inherent that the anode material would also use catalytic materials to increase current density and catalytic activity. As to claims 18 and 19, the Examiner states that the length of the fibers would have been obvious to decrease the size of the fibers of Li in order to affect the dimensions of the electrode.

Applicants' nanowires are dispersed in a patterned film to enhance catalytic activity. In sharp contrast, one of Li's electrodes includes fibrous materials (allegedly the same as Applicants' nanowires) and the other of Li's electrodes includes catalyst materials. Since Li's fibrous and catalyst materials are in two different electrodes, Li clearly does not anticipate Applicants' invention as defined in claims 1-10, 15-20, 48, 49, 68, 69 and 71.

Furthermore, Applicants respectfully disagree with the Examiner's conclusion that Li teaches that the electrode nanofibers enhance catalytic activity.

Li teaches that the metal anode includes fibrous, electrically conductive materials to enhance conductivity. Li also teaches that the cathode includes a generally suitable catalyst material to facilitate oxygen reaction. However, Li does not teach that the anode contains a catalyst material or that the anode fibrous, electrically conductive material is a suitable catalyst. One skilled in the art would be cognizant of the fact that conductivity and catalytic activity are not the same. Conductivity means "the quality or power of conducting or transmitting", and catalytic means "causing, involving, or relating to catalysis" (which is a modification and especially increase in the rate of a chemical reaction induced by material unchanged chemically at the end of the reaction) (<http://www.webster.com>). The specific teachings of Li, particularly in view of the distinctions between catalyst activity and conductivity, do not anticipate or suggest a nanowire that is capable of enhancing catalyst activity.

Still further, Applicants respectfully disagree with the Examiner's assertion that the cathode catalytic materials disclosed in Li would inherently increase current density and catalytic activity in the anode material.

The catalytic materials disclosed in Li are specifically included to "facilitate oxygen reaction at the cathode" (see paragraph [0045]). Such materials are suitable for use in the electrode at which reduction occurs. As such, one skilled in the art would not be led to include such catalyst materials in the anode, as the anode is the electrode of the fuel cell at which oxidation occurs. In further support of this argument, Applicants point out that none of the example conductive fibrous materials (in Li), which are suitable for the anode, overlap with the example catalyst materials, which are suitable for the cathode. In view of the fact that Li teaches that the fibrous conductive materials and the catalyst materials have **different** forms and are used in **different** environments, it is submitted that it is not taught, suggested or inherent to include fibrous conductive materials and catalyst materials in a single electrode.

For all the reasons stated above, it is submitted that Applicants' invention as defined in claims 1-10, 15-20, 48, 49, 68, 69 and 71 is not anticipated, taught or

rendered obvious by Li, either alone or in combination, and patentably defines over the art of record.

Claims 1-6, 9-10, 12-13, 49 and 69-71 stand rejected under 35 U.S.C. 102(e) as being anticipated by Mardilovich et al. (US Patent No. 6,770,353).

35 U.S.C. 102(e) states that "the invention was described in...(2) a patent granted on an application for patent by another...." David Champion, Peter Mardilovich, and Gergory S. Herman, all inventors in the above-identified patent application, are also inventors listed in the Mardilovich patent. Further, the above-identified patent application is assigned to HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P., as is the Mardilovich patent. As such, Applicants submit that the Mardilovich reference is not "by another" as required under the patent statute, and thus is not proper as a 35 U.S.C. §102(e) reference. Thus, withdrawal of the 35 U.S.C. 102(e) rejection of claims 1-6, 9-10, 12-13, 49 and 69-71 in view of Mardilovich is respectfully requested.

Claims 11 and 14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li and over Mardilovich, in view of Jeon et al. (U.S. Patent Publication No. 2004/0197626). The Examiner states that neither Li nor Mardilovich discloses that the anode metallic components include nickel-copper alloys, platinum, palladium, ruthenium, alloys thereof, or mixtures thereof; or that the cathode metallic components include rhodium, platinum, silver, alloys thereof, or mixtures thereof. The Examiner further states that Jeon discloses a solid oxide fuel cell in which the anode and cathode include catalyst nanoparticles. The Examiner concludes that it would have been obvious to include the materials of Jeon in the fuel cell of Li and/or Mardilovich because these components are good conductive materials.

As previously described, Li does not teach or suggest the fuel cell of Applicants' claim 1, from which claims 11 and 14 ultimately depend.

Mardilovich does not teach or suggest the fuel cell of Applicants' claim 1, in part because Applicants recite that the nanowires are dispersed in the patterned film (similar to a network of nanowires), and Mardilovich teaches nano-columnar structures that are

substantially aligned and separated from each other on a substrate surface.

"Dispersed" means "to distribute...more or less evenly throughout a medium" (<http://www.webster.com/dictionary/dispersed>). The nano-columnar structures of Mardilovich are clearly not dispersed throughout a medium, rather they are aligned on a substrate and have material established therebetween.

Furthermore, it is submitted that Jeon does not supply the deficiencies of either Li or Mardilovich. Jeon teaches the use of catalyst **nanoparticles** in an anode or a cathode. The nanoparticles are not the same as the nanowires recited by the Applicants. At most, the combination of Li and/or Mardilovich with Jeon may render obvious an anode having fibrous conductive material and catalyst nanoparticles (Li and Jeon); a nano-columnar structure including a first material, a second material, and catalyst nanoparticles (Mardilovich and Jeon); or combinations thereof. These combinations do not render obvious a patterned film having nanowires dispersed therein, where the nanowires enhance catalytic activity.

For all the reasons stated above, it is submitted that Applicants' invention as defined in claims 11 and 14 is not anticipated, taught or rendered obvious by Li, Mardilovich or Jeon, either alone or in combination, and patentably defines over the art of record.

Claims 16-19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mardilovich. The Examiner states that Mardilovich describes the fuel cell of claim 1 except for the diameter and/or length. The Examiner concludes that altering such dimensions would be obvious to one skilled in the art.

It is submitted that Mardilovich does not teach or suggest the fuel cell of Applicants' claim 1, from which claims 16-19 depend. It is submitted that claims 16-19 are patentable in view of their dependency from claim 1, at least in part because Mardilovich teaches nano-columnar structures that are substantially aligned on a substrate surface, not dispersed in a patterned film. For all the reasons stated above, it is submitted that Applicants' invention as defined in claims 16-19 is not anticipated,

taught or rendered obvious by Mardilovich, either alone or in combination, and patentably defines over the art of record.

In summary, claims 1-20, 48, 49 and 68-71 remain in the application. It is submitted that, through this amendment, Applicants' invention as set forth in these claims is now in a condition suitable for allowance.

Further and favorable consideration is requested. If the Examiner believes it would expedite prosecution of the above-identified application, she is cordially invited to contact Applicants' Attorney at the below-listed telephone number.

Respectfully submitted,

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